WHAT IS CLAIMED

1   1.   A kernel-level transaction system, comprising:

2   plural kernel objects to implement a transaction having plural operations;

3 and

4   a security descriptor, applied to at least one of the kernel objects, to identify

5 at least one user, to identify one of the operations of the transaction that may be

6 performed on the kernel object to which the security descriptor is applied, and to identify

7 a right indicating that the identified user is permitted or prohibited to perform the

8 operation.

1   2.   A system according to Claim 1, wherein the plural kernel objects

2 include:

3   a transaction object to represent a transaction;

4   a resource manager object to represent a resource participating in the

5 transaction; and

6   an enlistment object to enlist participants in the transaction.

1   3.   A system according to Claim 1, wherein the security descriptor

2 comprises at least one access control entry (ACE), which includes a security identifier

3 (SID) and rights corresponding to the SID.

1   4.   A system according to Claim 2, wherein the security descriptor is

2 applied to the transaction object, and the operation identified by the security descriptor

3 includes at least one of:

4   set information regarding the transaction object,

5   enlist the transaction object in the transaction,

6   render data updates in connection with the transaction object durable,

7   abort the operation on the transaction object,

8   transmit data from the transaction object to another object,

9   save the current point of the transaction at the transaction object, and

10   transmit data regarding the transaction to another device.

1   5.   A system according to Claim 2, wherein the security descriptor is

2 applied to the resource manager object, and the operation identified by the security

3 descriptor includes at least one of:

4   retrieve information regarding the resource manager object,

5   set information regarding the resource manager object,

6   determine the state of a transaction at a moment of transaction failure,

7   enlist the resource manager object in a transaction,

8   register the resource manager object in the transaction,

9   receive notification upon resolution of a transaction at the resource manager

10 object, and

11   set resource data in accordance with the transaction resolution.

1   6.   A system according to Claim 2, wherein the security descriptor is

2   applied to the enlistment object, and the operation identified by the security descriptor

3   includes at least one of:

4   get information regarding the enlistment object,

5   set information regarding the enlistment object,

6   determine a state of enlistments at a moment of transaction failure

7   obtain and reference an enlistment key,

8   rollback the transaction and to respond to notifications, and

9   perform operations a superior transaction manager would perform.

1   7.   A method of implementing a kernel-level transaction, comprising:

2   attaching a security descriptor to at least one of plural kernel objects

3   utilized in a transaction; and

4   performing an operation for a transaction on the at least one kernel object in

5   accordance with the rights accorded by the security descriptor attached to the at least one

6   kernel object.

1   8.   A method according to Claim 7, wherein the security descriptor

2   includes identification for at least one user, an operation that is able to be performed on

3   the at least one kernel object to which the security descriptor is attached, and a right

4   indicating that the identified user is permitted or prohibited to perform the operation.

1   9.   A method according to Claim 8, wherein the at least one kernel

2 object is a transaction object.

1   10.   A method according to Claim 8, wherein the at least one kernel

2 object is a resource manager object.

1   11.   A method according to Claim 8, wherein the at least one kernel

2 object is an enlistment object.

1   12.   A method according to Claim 9, wherein the operation identified by

2 the security descriptor attached to the transaction object includes at least one of:

3   set information regarding the transaction object,

4   enlist the transaction object in the transaction,

5   render data updates in connection with the transaction object durable,

6   abort the operation on the transaction object,

7   transmit data from the transaction object to another object,

8   save the current point of the transaction at the transaction object, and

9   transmit data regarding the transaction to another device.

1   13.   A method according to Claim 10, wherein the operation identified by

2 the security descriptor attached to the resource manager object includes at least one of:

3   retrieve information regarding the resource manager object,

4   set information regarding the resource manager object,

5   determine the state of a transaction at a moment of transaction failure,

6   enlist the resource manager object in a transaction,

7   register the resource manager object in the transaction,

8   receive notification upon resolution of a transaction at the resource manager

9   object, and

10   set resource data in accordance with the transaction resolution.

1   14.   A method according to Claim 11, wherein the operation identified by

2   the security descriptor includes at least one of:

3   get information regarding the enlistment object,

4   set information regarding the enlistment object,

5   determine a state of enlistments at a moment of transaction failure,

6   obtain and reference an enlistment key,

7   rollback the transaction and to respond to notifications, and

8   perform operations a superior transaction manager would perform.

1   15.   A computer-readable medium having stored thereon an object

2   attached to a kernel object, the object comprising:

3   a first data entry identifying at least one user;

4   a second data entry identifying an operation capable of being performed on

5   the kernel object by the user identified by the first data entry; and

6   a third data entry indicating a right for the user identified by the first data

7   entry to perform the operation identified by the second data entry.

1   16.   A computer-readable medium according to Claim 15, wherein the

2   kernel object is a transaction object, and the identified operation includes at least one of:

3   set information regarding the transaction object,

4   enlist the transaction object in the transaction,

5   render data updates in connection with the transaction object durable,

6   abort the operation on the transaction object,

7   transmit data from the transaction object to another object,

8   save the current point of the transaction at the transaction object, and

9   transmit data regarding the transaction to another device.

1   17.   A computer-readable medium according to Claim 15, wherein the

2   kernel object is a resource manager object, and the identified operation includes at least

3   one of:

4   retrieve information regarding the resource manager object,

5   set information regarding the resource manager object,

6   determine the state of a transaction at a moment of transaction failure,

7   enlist the resource manager object in a transaction,

8   register the resource manager object in the transaction,

9   receive notification upon resolution of a transaction at the resource manager

10   object, and

11   set resource data in accordance with the transaction resolution.

1   18.   A computer-readable medium according to Claim 15, wherein the

2   kernel object is an enlistment object, and the identified operation includes at least one of:

3   get information regarding the enlistment object,

4   set information regarding the enlistment object,

5   determine a state of enlistments at a moment of transaction failure,

6   obtain and reference an enlistment key,

7   rollback the transaction and to respond to notifications, and

8   perform operations a superior transaction manager would perform.

1   19.   A transaction method, comprising:

2   implementing a transaction among kernel objects; and

3   securing the transaction utilizing The Microsoft® Windows® operating

4   system security model.

1   20.   A transaction method according to Claim 19, wherein The

2   Microsoft® Windows® operating system security model includes applying a security

3   descriptor to at least one of the kernel objects participating in the transaction, and

4   wherein the security descriptor identifies at least one user, an operation to be performed

5   on the at least one kernel object to which the security descriptor is applied, and a right

6   indicating that the identified user is permitted or prohibited to perform the operation.

1   21.   A method of implementing a transaction, comprising:

2   attaching a security descriptor to at least one of plural objects utilized in a

3   transaction; and

4   performing an operation for a transaction on the at least one object in

5   accordance with the rights accorded by the security descriptor attached to the at least one

6   object.

1   22.   A method according to Claim 21, wherein the security descriptor

2   includes identification for at least one user, an operation to be performed on the at least

3   one object to which the security descriptor is attached, and a right indicating that the

4   identified user is permitted or prohibited to perform the operation.

1   23.   A method according to Claim 22, wherein the at least one object is a

2   transaction object.

1   24.   A method according to Claim 22, wherein the at least one object is a

2   resource manager object.

1   25.   A method according to Claim 22, wherein the at least one object is

2   an enlistment object.

1   26.   A method according to Claim 23, wherein the operation identified by

2   the security descriptor attached to the transaction object includes at least one of:

3   set information regarding the transaction object,

4   enlist the transaction object in the transaction,

5   render data updates in connection with the transaction object durable,

6   abort the operation on the transaction object,

7   transmit data from the transaction object to another object,

8   save the current point of the transaction at the transaction object, and

9   transmit data regarding the transaction to another device.

1   27. A method according to Claim 24, wherein the operation identified by

2 the security descriptor attached to the resource manager object includes at least one of:

3   retrieve information regarding the resource manager object,

4   set information regarding the resource manager object,

5   determine the state of a transaction at a moment of transaction failure,

6   enlist the resource manager object in a transaction,

7   register the resource manager object in the transaction,

8   receive notification upon resolution of a transaction at the resource manager

9 object, and

10   set resource data in accordance with the transaction resolution.

1   28. A method according to Claim 25, wherein the operation identified by

2 the security descriptor includes at least one of:

3   get information regarding the enlistment object,

4   set information regarding the enlistment object,

5   determine a state of enlistments at a moment of transaction failure,

6   obtain and reference an enlistment key,

7	rollback the transaction and to respond to notifications, and
8	perform operations a superior transaction manager would perform.

1	29. A kernel-level transaction system, comprising:
2	means for implementing a transaction among kernel objects; and
3	means for securing the transaction by applying a security descriptor to at
4	least one of the kernel objects,
5	wherein the security descriptor identifies at least one user, an operation to
6	be performed on the kernel object to which the security descriptor is applied, and a right
7	indicating that the identified user is permitted or prohibited to perform the operation.

1	30. A system according to Claim 29, wherein the kernel objects include:
2	a transaction object to represent a transaction;
3	a resource manager object to represent a resource participating in the
4	transaction; and
5	an enlistment object to enlist participants in the transaction.

1	31. A system according to Claim 30, wherein the security descriptor is
2	applied to the transaction object, and the operation identified by the security descriptor
3	includes at least one of:
4	set information regarding the transaction object,
5	enlist the transaction object in the transaction,
6	render data updates in connection with the transaction object durable,
7	abort the operation on the transaction object,

8   transmit data from the transaction object to another object,

9   save the current point of the transaction at the transaction object, and

10   transmit data regarding the transaction to another device.

1   32.   A system according to Claim 30, wherein the security descriptor is

2   applied to the resource manager object, and the operation identified by the security

3   descriptor includes at least one of:

4   retrieve information regarding the resource manager object,

5   set information regarding the resource manager object,

6   determine the state of a transaction at a moment of transaction failure,

7   enlist the resource manager object in a transaction,

8   register the resource manager object in the transaction,

9   receive notification upon resolution of a transaction at the resource manager

10   object, and

11   set resource data in accordance with the transaction resolution.

1   33.   A system according to Claim 30, wherein the security descriptor is

2   applied to the enlistment object, and the operation identified by the security descriptor

3   includes at least one of:

4   get information regarding the enlistment object,

5   set information regarding the enlistment object, and

6   determine a state of enlistments at a moment of transaction failure.